Appendix A

Statement of Work
"Innovative Ratemaking Treatment for Distributed Generation"

Synapse Energy Economics, Inc.
August 11, 2004

1.0 BACKGROUND

The goals of the National Energy Policy are to modernize conservation and the energy infrastructure, increase energy supplies, accelerate protection and improvement of the environment and increase energy security. Distributed energy resources (DER) will play a key role in maintaining and enhancing the reliability, power quality, security and environmental friendliness of the U.S. electric power system. The vision is for all customers - industrial, commercial, institutional, and residential – to be able to choose from a diverse array of ultra-high efficiency, ultra-low emission, fuel flexible, and cost-competitive DER products and services. These products and services will be easily interconnected with the nation's infrastructure for electricity, natural gas, and renewable energy resources. They will operate in an optimized manner to maximize value to both users and energy suppliers while protecting the environment.

Developing new approaches to ratemaking is critical in this stage of electric power system review and transformation. Technological and power system innovation in the national electric infrastructure may require corresponding regulatory innovation for successful development and deployment. Without specific efforts to modify traditional approaches to ratemaking and distribution system planning, the opportunity and promise of distributed generation may be lost. The work accomplished under this NREL subcontract with Synapse is expected to will provide a foundation for policy making at a time when a number of states are addressing what ratemaking treatment is appropriate for DG. As such, it will permit individual states, utilities, and other interested parties to build upon a solid basis of policy analysis and recommendations.

2.0 OBJECTIVE

The purpose of this Task is to develop the theoretical basis and make ready for adoption, innovative concepts and methods for ratemaking treatment of DG and DG related rate elements. The focus will be on ratemaking methods that are compatible with, and complementary to, the evolving technical approaches to integrating DG into distribution systems and electricity markets. Objectives are to determine the developing rates and tariffs that allow DER to be compensated for the full range of benefits it can provide consumers. These benefits, such as electricity cost reduction, power system expansion deferral, Transmission & Distribution loss reduction, etc. can improve the energy cost/value of states, including California, electricity.

3.0 SCOPE OF WORK

Through surveys of existing tariffs and regulatory proceedings and the DG community, Synapse will develop a framework for understanding the primary areas of concern to develop policy recommendations (which could include illustrative tariffs) regarding appropriate rate treatment of DG. This work will result in an assessment of the applicable concepts in ratemaking that will promote the cost-effective deployment of distributed generation in both monopolistic and restructured markets.

Synapse shall complete the investigations described in the following tasks and provide a detailed summary of this work in its reports and deliverables.

3.1 Task 1 Survey

The purpose of this task shall be a survey of the key issues that are raised in these proceedings by major participants (e.g., distribution companies, DG manufacturers, DG-owning customers, non-DG-owning customers, economic and environmental regulatory agencies, competitive suppliers).

The Synapse approach will be to review the ratemaking treatment of distributed generation proceedings from several states including New York, California, Texas, Massachusetts, Indiana, and Arizona. These proceedings typically cover issues such as stand-by and back-up tariffs for distribution and generation service and interconnection fees. The written comments submitted in these proceedings are a valuable resource for any investigation of ratemaking. Various commission decisions in completed investigations offer another important information source. In addition, a number of utilities (both vertically integrated and distribution-only) have tariffs that apply to customers with distributed generation. Synapse shall review the records in such proceedings. Where relevant, Synapse shall review experience in other countries.

Synapse shall use the survey to highlight principles and methods that should determine DG stand-by and other rate designs. Synapse shall also seek to identify DG cost centers, and provide general estimates of the costs that DG installations impose on a utility. Finally, Synapse shall also identify existing tariffs that contain innovative concepts in DG ratemaking.

The result of this Task shall be a Survey Summary Report, summarizing the key issues and existing tariffs identified in an annotated reference format.

Task 1 Deliverables Draft Survey Summary Report
Final Survey Summary Report

3.2 Task 2 3. Targeted Interviews

The purpose of this task shall be to explore issue areas that emerged from the survey in Task 1 and to begin to develop recommendations to address those issues.

The Synapse approach shall be to conduct targeted interviews with key personnel from utilities, DG manufacturers, DG customers, regulatory and other governmental agencies, and other interested parties shall supplement the survey work. One potential objective for these interviews (particularly those with utilities) shall be to identify specific costs (and benefits) associated with the deployment of distributed generation. Synapse shall rely in part on their extensive contacts in the regulatory community, and the 'Clean DG' community to identify appropriate interviewees.

Synapse shall develop an "Interview Questionnaire" and a "Proposed List of Interviewees" that shall be reviewed and approved by the NREL Project Manager and the California Energy Commission Contract Manager prior to conducting the interviews. At the conclusion of the interviews, prepare an Interview Summary Report in conjunction with NREL. The Interview Summary Report shall detail who was interviewed, when they were interviewed and provide a summary of each interviewee's comments and responses to the Interview Questionnaire. Key elements of this Task shall be basis for the Synapse Final Report.

Task 2 Deliverables: Draft Interview Questionnaire
Final Interview Questionnaire
Draft Proposed Interviewee List
Final Proposed Interviewee List
Interview Summary Report

Task 3 Policy Analysis and Recommendations

The purpose of this task is to prepare policy recommendations based upon results of Tasks 1 and 2.

The Synapse approach shall be to analyze the results of Tasks 1 and 2 as a basis for preparing policy recommendations and, as appropriate, illustrative tariffs to implement those policy recommendations. The policy recommendations shall address the range of rate design issues raised by DG, including interconnection fees, standby (or backup) charges, demand and energy rates, cost allocation (marginal and embedded), potential utility stranded costs, etc. Key elements of this Task shall be basis for the Synapse Final Report.

Task 3 Deliverables: Draft Final Report
Final Report

4.0 DELIVERABLES/REPORTING REQUIREMENTS

4.1 Deliverables

Synapse shall provide deliverables according to the following schedule:

No.	Deliverable Description	Quantity	Date
	D-1-1 to D-1-11 Monthly Reports	2	Due 15th of October 2004 through June, 2005
D-2	Draft Survey Summary Report (Task 1)	3	Nov. 14, 2004
D-3	Final Survey Summary Report (Task 1)	3	Dec. 15, 2004

D-4	Draft Interview Questionnaire (Task 2)	3	Oct. 13, 2004
D-5	Final Interview Questionnaire (Task 2)	3	Nov.10, 2004
D-6	Draft Proposed Interviewee List (Task 2)	3	Oct. 13, 2004
D-7	Final Proposed Interviewee List (Task 2)	3	Nov. 10, 2004
D-8	Interview Summary Report (Task 2)	3	Mar. 10, 2005
D-9	Draft Final Technical Status Report	3	April 30, 2004
D-10	Final Technical Status Report	3	June 30, 2004
D-11	Presentation Materials for Annual Program Review	3	TBD

Deliverables (hardcopy and electronic versions) shall be sent to the Technical Monitor (electronic version and two hardcopies), the Distributed Energy and Electricity Reliability (DEER) Technology Manager, and the Subcontract Associate at the following addresses:

National Renewable Energy Laboratory
ATTN: Holly Thomas MS 1614
Technical Monitor
1617 Cole Blvd.
Golden, CO 80401

National Renewable Energy Laboratory
ATTN: Dick DeBlasio MS1614
NREL DER Technology Manager
1617 Cole Blvd.
Golden, CO 80401

National Renewable Energy Laboratory
ATTN: Carolyn Lopez MS 2713
Subcontract Associate
1617 Cole Blvd.
Golden, CO 80401

4.2 REQUIRED REPORTS

4.2.1 Monthly Technical Status Report

The Monthly Progress Report shall communicate to NREL an assessment of subcontract status, explain variances and problems, report on the accomplishment of performance milestones and/or deliverables, and discuss any other achievements or areas of concern. These reports shall be prepared in accordance with the template provided in Attachment (A-1). They need to be written with emphasis on the status of, rather than a description of the progress. The Monthly Progress Report shall summarize all subcontract activities conducted by the subcontractor to date, with an assessment of ability to complete the project within the current budget and any anticipated cost overruns.

The first item of each report shall be an introductory paragraph will be included in each monthly report that provides a highlight of the month's activities and significance of the reported work

The report MUST be submitted in accordance with the template Attachment A. Any Monthly Reports not submitted in this format will not be accepted.

Submission: **Four (4) copies of this report are due on or before fifteen (15) days after completion of each month** with copies to NREL Technical Monitor (two copies), NREL DEER Technology Manager and NREL Subcontract Associate.

4.2.2 Final Technical Status Report

The Final Technical Status Report shall describe all work performed during the entire subcontract's period of performance.

The report shall be written in accordance with the guidelines described in Section 4. 3 Attachment A-2. **Reports that do not meet these requirements will not be accepted.**

Four (4) copies of the Draft Final Technical Status Report shall be sent to the names listed in Section 4.1 on or before fifteen (15) days after the final year's completion date for active research under this subcontract. The subcontractor shall make any corrections or revisions to the draft document per NREL direction. Subcontractors shall be allowed fifteen (15) days after receipt of NREL's recommendations and/or changes to implement any changes or revisions. The final version with two reproducible master copies shall be sent to the NREL Technical Monitor in accordance with the requirements listed in Section 4.3.

4.3 REQUIRED REPORTING FORMAT

4.3.1 Timing

If the period of performance for this subcontract begins during the first through the fifteenth of a month, then that month is considered the first full month of the subcontract for reporting purposes. If the period of performance for this subcontract begins during the sixteenth through the end of the month, then the first full month of the subcontract for reporting purposes is the following month. For example, if the period of performance start date is January 10, then January is the first full month for reporting purposes: whereas, if the period of performance start date is January 20, then February is the first full month for reporting purposes.

4.3.2 Written Format:

Reports should be written to adhere to the NREL Style Guide, 5th Edition. This document can be accessed on Web at <http://www.nrel.gov/docs/gen/fy01/24935.pdf>. Printed copies may also be available through NREL Document Distribution. This guide covers basic formatting, grammar, and style issues for all NREL printed products.

4.3.3 Electronic Reporting Requirements for Subcontract Report Deliverables

As set forth in Department of Energy Order 241.1A, NREL is required to submit in an electronic format all scientific and technical information, including subcontract report deliverables intended for public distribution, to the DOE Office of Scientific and Technical Information (OSTI). In addition, it is NREL's intention to post subcontract report deliverables containing publicly available information (e.g. non-confidential, non-protected, non-proprietary information) for distribution on the NREL Intranet or the Internet.

The Subcontractor shall provide the final approved version of report deliverables intended for public distribution as specified in the deliverable schedule of this Statement of Work in accordance with the following electronic reporting requirements:

a. The Subcontractor shall submit all report deliverables intended for public distribution (including status, annual, or final reports) as electronic files, preferably with all graphics and images embedded within the document. The electronic files shall be submitted along with an accompanying hard (printed) copy(ies) of the report. Limited exceptions allowing some graphics and images to be submitted as hard copies only may be granted on a case-by-case basis. The exceptions process for graphics and images is described in Paragraph E below. It shall be made clear in the deliverable transmittal letter that certain graphics and images are supplied in hard copy only.

b. All final approved version submissions shall be delivered to NREL on PC or MAC-formatted media (3.5 inch disks, Zip and Jaz cartridges, or CD-ROM). Files of 1 Mb or less can be sent via e-mail to the 1) NREL technical monitor, 2) the NREL Subcontract Administrator or Associate (as specified in Section 4.1).

c. The preferred format is a single electronic file that includes all of the text, figures, illustrations, and high-resolution digital photographs (or photographs should be scanned and incorporated in the text). Acceptable file formats are:
   - Microsoft Word (v.6.0 or newer for PC or MAC)
   - WordPerfect (v.6.1 or newer for PC)
   - Microsoft PowerPoint
   - Microsoft Excel

d. If it is not possible to include all of the graphics and images (figures, illustrations, and photographs) in the same file as the text, NREL will accept the text in one of the above formats and the graphics and images as separate electronic graphic or image files*. The native files for any page layout formats submitted shall be supplied. The following software is supported on both Mac and PC platforms:

   - QuarkXPress (.qxd)
   - Pagemaker (.pm)
   - Photoshop (.psd)
   - Illustrator (.ai)
   - Freehand (.fh)
   - Corel Draw (.cdr)

- Framemaker (.fm)
- Microsoft Publisher (.pub)

*The acceptable graphic or image file formats are: .eps, .tif, .gif, .jpg, .wpg, .wmf, .pct, .png, .bmp, .psd, .ai, .fh, .cdr. The preferred resolution for graphics or images is 150 to 300 dpi. Include all fonts that were used in creating the file.

e. In the rare case that the graphics or images cannot be supplied electronically, either incorporated within the text or as a separate electronic file, original hard copies will be accepted. The Subcontractor shall obtain prior approval from the Subcontract Administrator before submitting graphics or images in hard copies. It shall be made clear in the deliverable transmittal letter that certain graphics and images are supplied in hard copy only.

f. For all calculations in support of subcontract reports that are conducted in SPEN+, an electronic copy of INPUT, REPORT and BACKUP (if Model Manager is used) must be submitted with all reports. Additionally, if costing or sizing calculations are conducted in a spreadsheet [no process calculations (heat and material balances) in spreadsheet format are permitted], a copy of the fully documented MS Excel file shall be supplied. Note that vendor quotes and other non-original material can be supplied in hard copy.

g. A fully executed release shall be supplied to NREL with all photographs, regardless of whether such photographs are delivered to NREL electronically or in hard copy. Such release shall certify that the National Renewable Energy Laboratory and the United States Government is granted a non-exclusive, paid-up, irrevocable, worldwide license to publish such photographs in any medium or reproduce such photographs or allow others to do so for United States Government purposes.

h. The Subcontractor may contact their Subcontract Administrator or the NREL Publication Services at (303) 275-3644 with questions regarding technical guidance concerning the submission of subcontract report deliverables as electronic files or exceptions to electronic files for graphics and images.

4.4 MEETINGS, PRESENTATIONS AND PUBLICATIONS

4.4.1 Presentations and Publications

Summaries

The subcontractor will prepare a draft and final summary information for a fact sheet describing the background, significance, goals/intent, approach, and, expected results and status, expected outcome, and future direction/opportunities (annually, 2 - 3 pages that includes a few graphics). Additionally, the contractor will prepare a draft and final executive summary/contract summary (annually, 2 - 3 pages that includes a few graphics). Each shall be transmitted both electronically and as a reproducible master hardcopy to the NREL Technical Monitor, and copy of the transmittal letter only, to

NREL Technology Manager, CEC Project Manager and NREL Subcontract Associate as listed in Section 4.1.

Presentations
Presentations at technical meetings and publications of research results in scientific journals are encouraged by NREL. Any costs to NREL, which are to be incurred as a result of such presentations/publications, have been included in the negotiated cost of the subcontract.

The subcontractor **shall submit four (4) copies of any publication/presentation** (e.g., abstract, preprint of manuscript, etc.) **concerning the research effort under this subcontract, PRIOR TO PUBLICATION, to the NREL Technical Monitor. NREL approval, which will include Commission Management approval, is required. The subcontractor should allow at least sixty (60) days to obtain the appropriate technical approval for the publication or presentation.**

Prior to publication, the subcontractor shall obtain written notice of NREL's technical approval. If the subcontractor is other than a small business concern or non-profit organization who qualifies under P.L. 98-620, the subcontractor shall also obtain DOE patent clearance in accordance with Clause 1-Patent Rights (Long Form) of Appendix C-1 of this subcontract, prior to any publication or presentation concerning this subcontract effort.

The subcontractor is reminded that the **technical approval** and the **patent clearance** requirements, as specified above, also apply to reports requiring distribution outside of NREL.

The subcontractor shall also be prepared to respond to requests for written information in summary form as required by the Technical Monitor. Such requests include, but are not limited to, Program Summaries (annually, 1-2 pages) and Summary Annual Reports (2-3 pages). These may be requested annually, and NREL does not at this time expect any others during the subcontract period of performance. These are in addition to other reporting requirements described above.

4.4.2 Meetings
The subcontractor shall attend and present their subcontract research progress at the annual Electric Distribution Transformation Program Review Meeting (held at a place and time specified by DOE/NREL) and semi-annual NREL/CEC joint meeting in Sacramento, CA (or other designated location). For participation in these meetings, the subcontractor shall prepare the draft presentation and information for NREL comment prior to the meeting, incorporate comments, then submit the final, reproducible master copy of the materials prior to the review meetings to the NREL Technical Monitor.

- Subcontract Kickoff Meeting (teleconference, within the first 90 days of signing the contract) with the key team members, NREL Technical Monitor, NREL

Contract Manager and the Commission Contract Manager to discuss all aspects of the subcontract.

- Annual DOE Program Meeting (tentative location, Washington DC). DTE shall prepare information, attend, and present at the Annual DOE Electric Distribution Transformation Program Review Meeting considering Washington DC for planning purposes (final location and time specified by DOE/NREL). The subcontractor shall present a complete discussion of work performed under this subcontract.
- Semi-annual Subcontract Review Meeting (Sacramento, CA). Subcontractor shall prepare information and present results of their progress at a subcontract review meeting planned for the California Energy Commission facilities in Sacramento, CA.
- Final Subcontract Review Meeting (Sacramento, CA). The Subcontractor will participate in a Final Meeting at the California Energy Commission facility, as specified and scheduled by NREL. The contents of the Final Report shall be presented along with answers to questions previously supplied by NREL and the Commission Contract Manager.